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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,422	05/24/2001	William D. Norcott	50277-1006	9402

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EXAMINER	
ALI, MOHAMMAD	
ART UNIT	**PAPER NUMBER**
2177	4

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/863,422	NORCOTT, WILLIAM D.	
	Examiner	Art Unit	
	Mohammad Ali	2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This communication is responsive to the Preliminary Amendments filed on May 24, 2001. The application has been examined and claims 1-11 are pending in this Office Action.

Specification

2. (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

In specification, page 2, paragraphs 01, 02, and page 11, paragraph 29 the pending Application Number is missing. Pending Application Number needs to be entered in the specification.

Appropriate correction is required.

The disclosure is objected to because of the following informalities: in page 5, paragraph 10, line 8 the word "inasmuch" should be written as "in as much".

Appropriate correction is required.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate

paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

In specification page 10, paragraph 27, lines 9-10, the US Patent Application is listed.

It should be listed in the IDS-1449.

Appropriate correction is required.

Drawings

4. The drawings filed on May 24, 2001 is approved by the Draftperson under 37 CFR 1.84 or 1.152, see attached Form PTO-948.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Lorie et al. ('Lorie' hereinafter), US Patent 5,280,612.

With respect to claim 1,

Lorie teaches a method for synchronous change data capture (see col. 15, lines 47-45), comprising the steps of:

generating a transaction identifier that uniquely identifies a transaction (a record data pointer, PTR, which points to the location in storage containing the record data for this record version and a transaction identifier TRN, which indicates the sequential identifier for the transaction that created this record version, see col. 8, lines 59-63);

for each operation in a transaction (see col. 13, lines 9-11, Lorie), recording change data for the operation and the transaction identifier in a first database object (the system maintain a record key structure for each record in the database. The database has series of records, each of which is identified by such a key, which can be a logical key or any other suitable type of record identifier, see col. 8, lines 37-46, Fig. 2, Lorie); and

during a commit of the transaction (see col. 11, lines 11-16, Lorie), recording the transaction identifier and a system change number in a second database object (a first version, PTR(1), representing the uncommitted state of record, a second version, PTR(2), representing the last committed value that is not in the stable state, and third version, PTR(3), representing the stable state for type Q queries. These three versions are organized in a record key structure, see col. 8, lines 50-58 et seq, Lorie).

As to claim 2,

Lorie teaches further comprising the step of: recording an identifier to identify a relative ordering of each operation in the transaction (each new transaction is initiated a TRN serial number is assigned in sequence, for TRN numbers M and following. The UL

and NSUL are organized as bit map vectors indexed according to the TRN serial number such that a bit in each list is set to one to include the corresponding TRN serial number on the list, see col. 9, lines 62-67 and col. 8, lines 37-42, Fig. 3).

As to claim 3,

Lorie teaches further comprising, during the commit of the transaction (see col. 8, lines 50-58), the steps of:

obtaining a concurrency lock (query must access the most recent database version, it is relabeled and restarted as an updating transaction and thereby acquire the necessary read locks on all data, see co. 5, lines 4-7 and col. 6, lines 13-15);

after obtaining the concurrency lock, generating the system change number (see col. 5, lines 8-14, Lorie) and performing said recording the transaction identifier and the system change number in the second database table (version control and tracking is implemented by maintaining several version transaction identification lists. In main memory, the system maintains a list of uncommitted update transaction and list of committed but not yet stable state update transactions. The record key version provides a each record version and identifies the creating transaction for each record version, see col. 5, lines 34-44 and col. 13, lines 10-17 et seq, Lorie), and concluding the commit (a new version of a record is created whenever any updating transaction writes new data to a record that was created by a previous committed transaction, see col. 5, lines 23-25, Lorie); and

after said recording the transaction identifier and the system change number in the second database table (see col. 5, lines 34-44 and col. 13, lines 10-17 et seq,

Lorie), releasing the concurrency lock (force to write the commit record log, remove the transaction number form UL and release all locks, see col. 14, lines 51-53 and col. 11, lines 11-15, Lorie).

As to claim 4,

Lorie teaches wherein the first database object comprises a change table and the second database object comprises a transaction table (when transaction activity is low, if a page is modified, then all records on the page can be scanned for supercilious versions, taking into account the UL and NSUL tables "first and second table" as for an update operation. When the transaction activity is very low, a garbage collection transaction can clean up a few pages at a time. This would bring down the average number of record versions in the database and would be particularly appropriate for a dedicated back-end database machine, see col. 13, lines 9-17).

As to claim 5,

Lorie teaches further comprising the step of: associating the change data in the first database object with the system change number in the second database object based on the transaction identifier (version block record key structure is associated with record data. Version control and tracking is implemented by maintaining several version transaction identification lists. In main memory, the system maintains a list of uncommitted update transaction and list of committed but not yet stable state update transactions. The record key version provides a each record version and identifies the creating transaction for each record version, see col. 5, lines 32-52 and col. 13, lines 10-17 et seq, Lorie).

As to claim 6,

Lorie teaches a computer-readable medium (see col. 5, lines 36-38, Lorie) bearing instructions for synchronous change data capture (see col. 15, lines 47-51, Lorie), said instructions arranged, upon execution (two version rules for actions taken at various stage of the execution of a transaction and a query, see col. 10, lines 18-21 Lorie), to cause one or more processors to perform the steps of the method (when transaction activity is low, if a page is modified, then all records on the page can be scanned for supercilious versions, taking into account the UL and NSUL tables as for an update operation. When the transaction activity is very low, a garbage collection transaction can clean up a few pages at a time. This would bring down the average number of record versions in the database and would be particularly appropriate for a dedicated back-end database machine, see col. 13, lines 9-17, Lorie).

With respect to claim 7,

Lorie teaches a method for processing synchronously captured change data (see col. 15, lines 47-51, Lorie), comprising:

accessing a first database object (access the most recent database version, it relabeled and restarted as an updating transaction and thereby acquire the necessary read locks on all data, see col. 5, lines 3-7, Lorie) comprising change data for an operation performed within a transaction and a transaction identifier that uniquely identifies the transaction (a record data pointer, PTR, which points to the location in storage containing the record data for this record version and a transaction identifier

TRN, which indicates the sequential identifier for the transaction that created this record version, see col. 8, lines 59-63, Lorie);

accessing a second database object comprising the transaction identifier and a system change number (version control and tracking is implemented by maintaining several version transaction identification lists. In main memory, the system maintains a list of uncommitted update transaction and list of committed but not yet stable state update transactions. The record key version provides a each record version and identifies the creating transaction for each record version, see col. 5, lines 34-44 and col. 13, lines 10-17 et seq, Lorie); and

associating the change data in the first database object with the system change number in the second database object based on the transaction identifier (version block record key structure is associated with record data. Version control and tracking is implemented by maintaining several version transaction identification lists. In main memory, the system maintains a list of uncommitted update transaction and list of committed but not yet stable state update transactions. The record key version provides a each record version and identifies the creating transaction for each record version, see col. 5, lines 32-52 and col. 13, lines 10-17 et seq, Lorie).

As to claim 9,

Lorie teaches a computer-readable medium (see col. 5, lines 36-38, Lorie) bearing instructions for synchronous change data capture (see col. 15, lines 47-51, Lorie), said instructions arranged, upon execution (two version rules for actions taken at various stage of the execution of a transaction and a query, see col. 10, lines 18-21

Lorie), to cause one or more processors to perform the steps of the method (when transaction activity is low, if a page is modified, then all records on the page can be scanned for supercilious versions, taking into account the UL and NSUL tables "first and second table" as for an update operation. When the transaction activity is very low, a garbage collection transaction can clean up a few pages at a time. This would bring down the average number of record versions in the database and would be particularly appropriate for a dedicated back-end database machine, see col. 13, lines 9-17, Lorie).

With respect to claim 10,

Lorie teaches a method for synchronous change data capture (see col. 15, lines 47-51, Lorie), comprising the steps of:

generating a transaction identifier that uniquely identifies a transaction (a record data pointer, PTR, which points to the location in storage containing the record data for this record version and a transaction identifier TRN, which indicates the sequential identifier for the transaction that created this record version, see col. 8, lines 59-63);

for each operation in a transaction (see col. 13, lines 9-11, Lorie), recording change data for the operation and the transaction identifier in a change table (the system maintain a record key structure for each record in the database. The database has series of records, each of which is identified by such a key, which can be a logical key or any other suitable type of record identifier, see col. 8, lines 37-46, Fig. 2); and

during a commit of the transaction (see col. 8, lines 50-58), performing the steps of:

obtaining a concurrency lock (query must access the most recent database version, it is relabeled and restarted as an updating transaction and thereby acquire the necessary read locks on all data, see co. 5, lines 4-7 and col. 6, lines 13-15);

after obtaining the concurrency lock, generating a system change number (see col. 5, lines 8-14, Lorie) and recording the transaction identifier and the system change number in the second database table (version control and tracking is implemented by maintaining several version transaction identification lists. In main memory, the system maintains a list of uncommitted update transaction and list of committed but not yet stable state update transactions. The record key version provides a each record version and identifies the creating transaction for each record version, see col. 5, lines 34-44 and col. 13, lines 10-17 et seq, Lorie); and

after said recording the transaction identifier and the system change number in the second database table (see col. 5, lines 34-44 and col. 13, lines 10-17 et seq, Lorie), releasing the concurrency lock (force to write the commit record log, remove the transaction number form UL and release all locks, see col. 14, lines 51-53 and col. 11, lines 11-15, Lorie).

As to claim 11,

Lorie teaches a computer-readable medium (see col. 5, lines 36-38, Lorie) bearing instructions for synchronous change data capture, said instructions arranged, upon execution (two version rules for actions taken at various stage of the execution of a transaction and a query, see col. 10, lines 18-21 Lorie), to cause one or more processors to perform the steps of the method (when transaction activity is low, if a

page is modified, then all records on the page can be scanned for supercilious versions, taking into account the UL and NSUL tables "first and second table" as for an update operation. When the transaction activity is very low, a garbage collection transaction can clean up a few pages at a time. This would bring down the average number of record versions in the database and would be particularly appropriate for a dedicated back-end database machine, see col. 13, lines 9-17, Lorie).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorie et al. ('Lorie' hereinafter), US Patent 5,280,612 as applied to claims 1-7 and 9-11 above in view of Robert David Goldring ('Goldring' hereinafter), US Patent 5,553,279.

As to claim 8,

Lorie teaches wherein the step of associating includes performing a database operation on the first database object and the second database object (when transaction activity is low, if a page is modified, then all records on the page can be scanned for supercilious versions, taking into account the UL and NSUL tables "first and second table" as for an update operation. When the transaction activity is very low, a

garbage collection transaction can clean up a few pages at a time. This would bring down the average number of record versions in the database and would be particularly appropriate for a dedicated back-end database machine, see col. 13, lines 9-17 and col. 5, lines 48-52).

Lorie does not explicitly indicate the claimed "join operation".

Goldring discloses the claimed join operation (the Consistent_Change_Data table includes only updates that have been committed and is created by performing an SQL join operation on the Change_Data and VOW tables, see col. 7, lines 1-3, Fig. 6, Goldring).

It would have obvious to one ordinary skill in the data processing art at the time of the present invention, to combine the teachings of the cited references, because join operation of Goldring's teaching would have allowed Lorie's system the to produce multi-generational copies of data base tables for replication from one copy level to any other subsequent level, or iteration of copy without losing any change information, as suggested by Goldring, at col. 3, lines 12-14. Join operation as taught by Goldring improves consistent change data tables that contains commit time information for placing transactions in the order which they are committed in the operation (see col. 3, lines 29-34, Goldring).

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Ali whose telephone number is (703) 605-4356. The examiner can normally be reached on Monday to Thursday from 7:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (703) 305-9790 or Customer Service (703) 306-5631. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for any communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9600.

Mohammad Ali

Patent Examiner

AU 2177

MA

October 28, 2003